

Chesapeake Bay Program
A Watershed Partnership

Proposed Data layers for PCB Resource Center

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Introduction

- PCB Resource Center
 - One stop shop for all resources pertaining to implementing TMDLs
- Mapping Center
 - Source Identification
 - Point source
 - Nonpoint source
 - Relative Risk evaluation

Current Efforts

PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

1 PCB Impairments

Polychlorinated biphenyls (PCBs) are a class of pollutants that are widely distributed in the Chesapeake Bay watershed. PCBs are very persistent and accumulate in fish, which can make fish unsafe to eat. This map shows areas of the watershed where PCBs have been found at levels that the states believe impair ecological health or make fish unsafe to eat.

2 PCB TMDLs as of 2015

3 PCB TMDLs Planned for Development

4 PCB Impairments without Existing or Planned TMDLs



PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

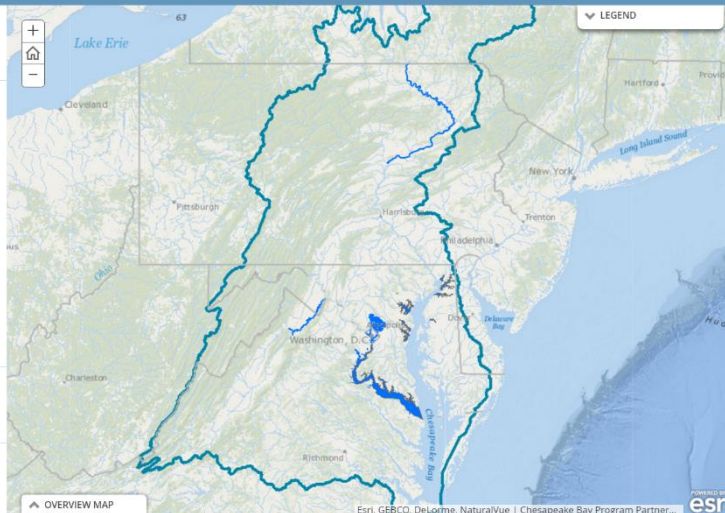
1 PCB Impairments

2 PCB TMDLs as of 2015

When the states determine that a waterbody is impaired, they are required by the Clean Water Act to make a plan to reduce pollution. Such a plan is called a Total Maximum Daily Load (TMDL). This map shows where the states have developed TMDLs for PCBs.

3 PCB TMDLs Planned for Development

4 PCB Impairments without Existing or Planned TMDLs



PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

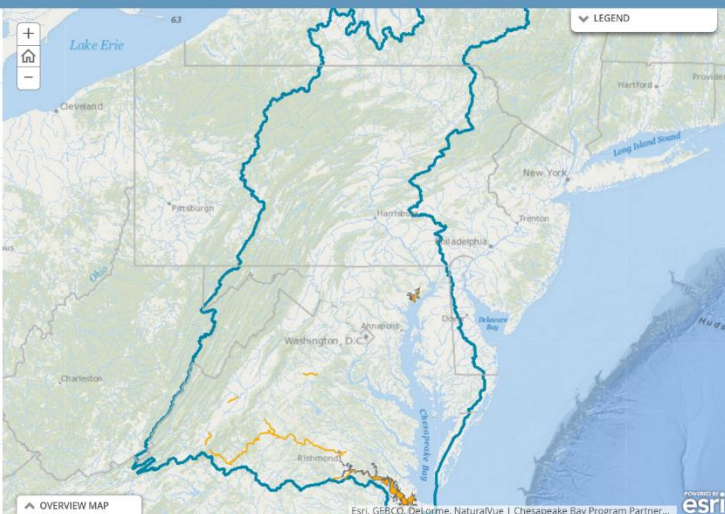
1 PCB Impairments

2 PCB TMDLs as of 2015

3 PCB TMDLs Planned for Development

The development of a TMDL is a lengthy process. This map shows where PCB TMDLs are currently being developed.

4 PCB Impairments without Existing or Planned TMDLs



PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

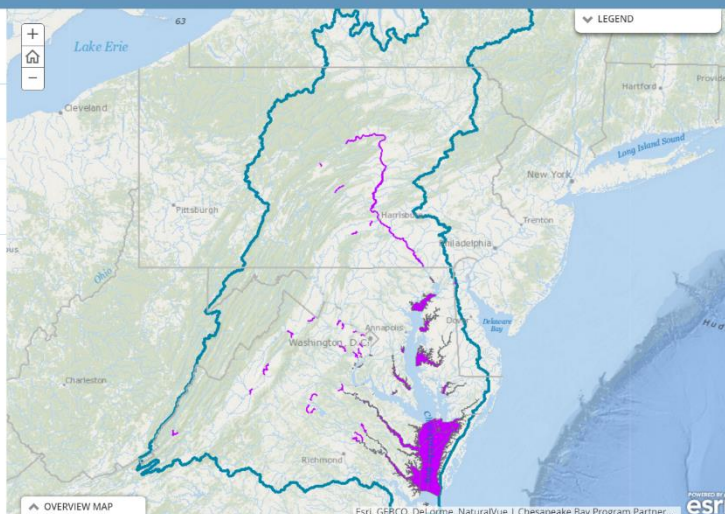
1 PCB Impairments

2 PCB TMDLs as of 2015

3 PCB TMDLs Planned for Development

4 PCB Impairments without Existing or Planned TMDLs

There are areas in the Chesapeake Bay watershed that do not have TMDLs in place or under development to address PCBs. This map shows those areas. These are the places where the Chesapeake Bay Program partnership can work together to develop TMDLs and reduce the amount of PCBs in the environment including the PCBs that accumulate in fish.



Mapping Center – Mapping sources of PCBs

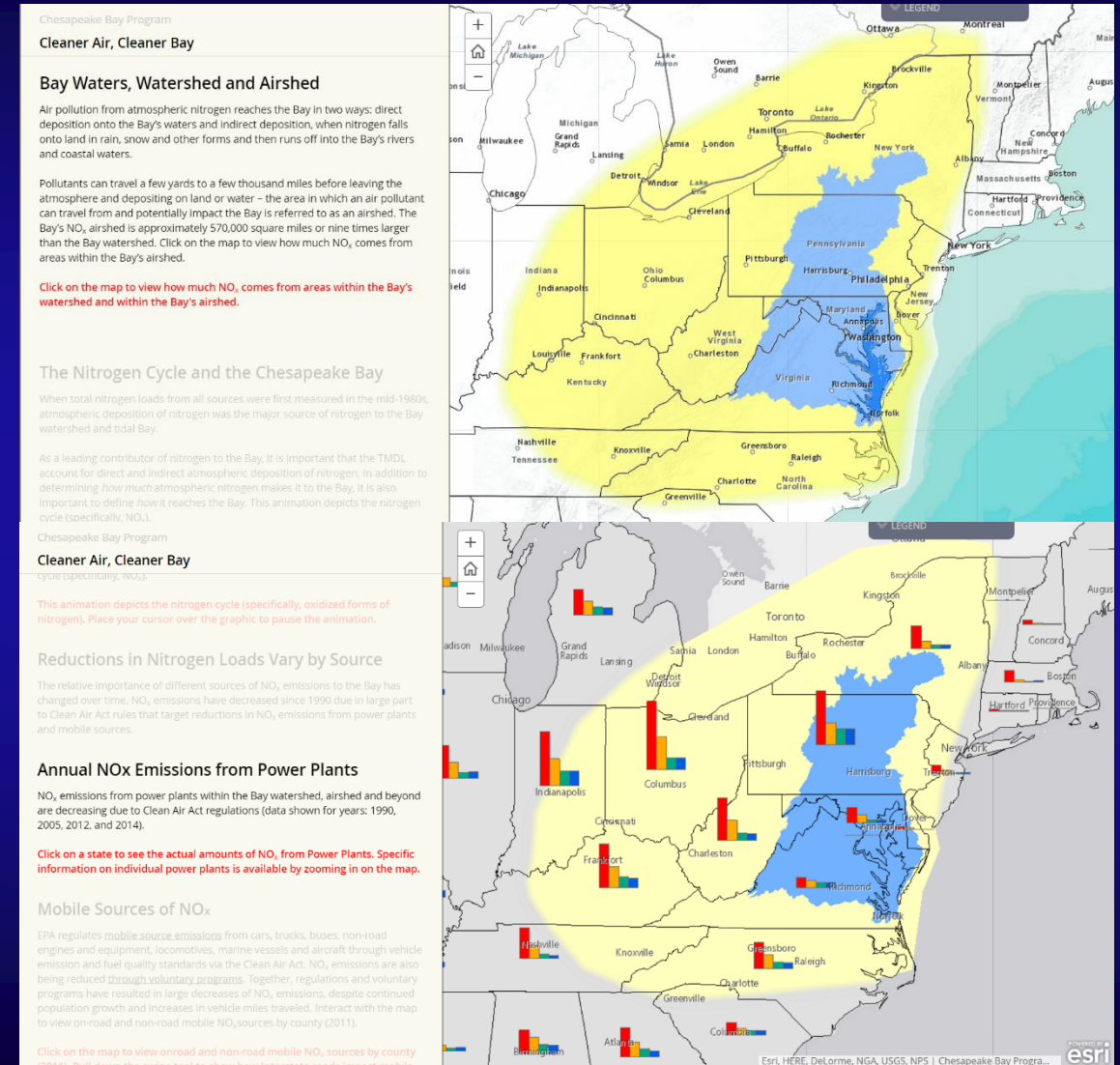
- Sources of PCBs per Agency for Toxic Substances and Disease Registry
 - Uncontrolled landfills *
 - Hazardous waste sites *
 - Incineration of PCB-containing wastes
 - Leakage from older electrical equipment
 - Improper disposal or spills *
 - CSOs *
 - Storm water runoff *
 - Leachate from PCB contaminated sewage sludge applied to farmland
 - Deposition of vehicular emissions near roadway soil
- EPA regulated sites for PCBs
 - Point locations for Storage and disposal facilities *
 - Regulated/registered PCB transformers locations *
 - Facilities approved for specific decontamination processes *
 - PCB activity facilities *
 - Shipyards *
 - Superfund sites
 - Brownfield sites
 - RCRA sites

Mapping Center – Sources and Hot Spots

- Other potential Source data
 - Age of Development (Census Block Group Percent developed pre-1980) *
 - Impervious Surface data *
 - Recycling facilities (particularly electronics recycling)
 - TRI database – queried for PCB CAS #'s
 - FRS database – queried for pertinent industry segments
 - National Response Center Reports – queried for PCB CAS #'s (coast guard database of all toxic contaminant spills in the US)
 - ATSDR National Toxic Substance Incidents Program National Database (data from USDOT, National Response Center, State health departments, and the media pertaining to toxic spills)
 - Volatile Organic Compound data from Nation Emissions Inventory?
 - Volatization and Atmospheric deposition (see airshed in next slide)
 - Runoff and flow information from NAWQ and NWIS sources (see fox river study slides) *
- Pertinent regulatory data layers
 - MS4 areas, CSOs, Publically Owned Treatment Works*
 - Current PCB impairments and TMDLs obtained from State's Integrated Water Quality Assessments*
- Risk Data layers
 - Public Access points*
 - Indicator species habitat and/or occurrence (fish, crabs, etc) * (define which species)
 - End User Monitoring Data – Lab results and location of state tests for PCBs, sediment, and turbidity

Volatization and Atmospheric Deposition

- “PCB inputs into aquatic and marine reservoirs are predominantly from wet and dry deposition and from the recycling of sediment-sorbed PCBs into the water column.” ¹
- Chesapeake Bay Airshed
 - Previous GIS products looking at NO_x deposition
 - PCB specific airshed
 - Lit review for atmospheric transport and deposition of PCBs
 - Wet deposition could be associated with rain fall and precipitation data ¹
 - Dry deposition mostly happens in urban centers ¹



1. <https://www.atsdr.cdc.gov/toxprofiles/tp17-c6.pdf>

Seasonal Influence of PCB transport – Fox River PCB Transport Study

- Maximum PCB concentrations occurred at high flow and during the summer. PCB concentrations in water exceeded 100 ng/L only under high flow conditions (that is, during storm events). Greater than 60% of the PCB transported over the DePere Dam occurred during only 20% of the year, times when discharge was above the annual mean of 120 m³/s (4,257 ft³/s). These events are represented as the steep increases in the cumulative PCB transport during the summer high flow-event and spring runoff in Figure 5. 2
- High flow during winter time (where flow is determined by groundwater intrusion) did not see elevated PCB transport 2

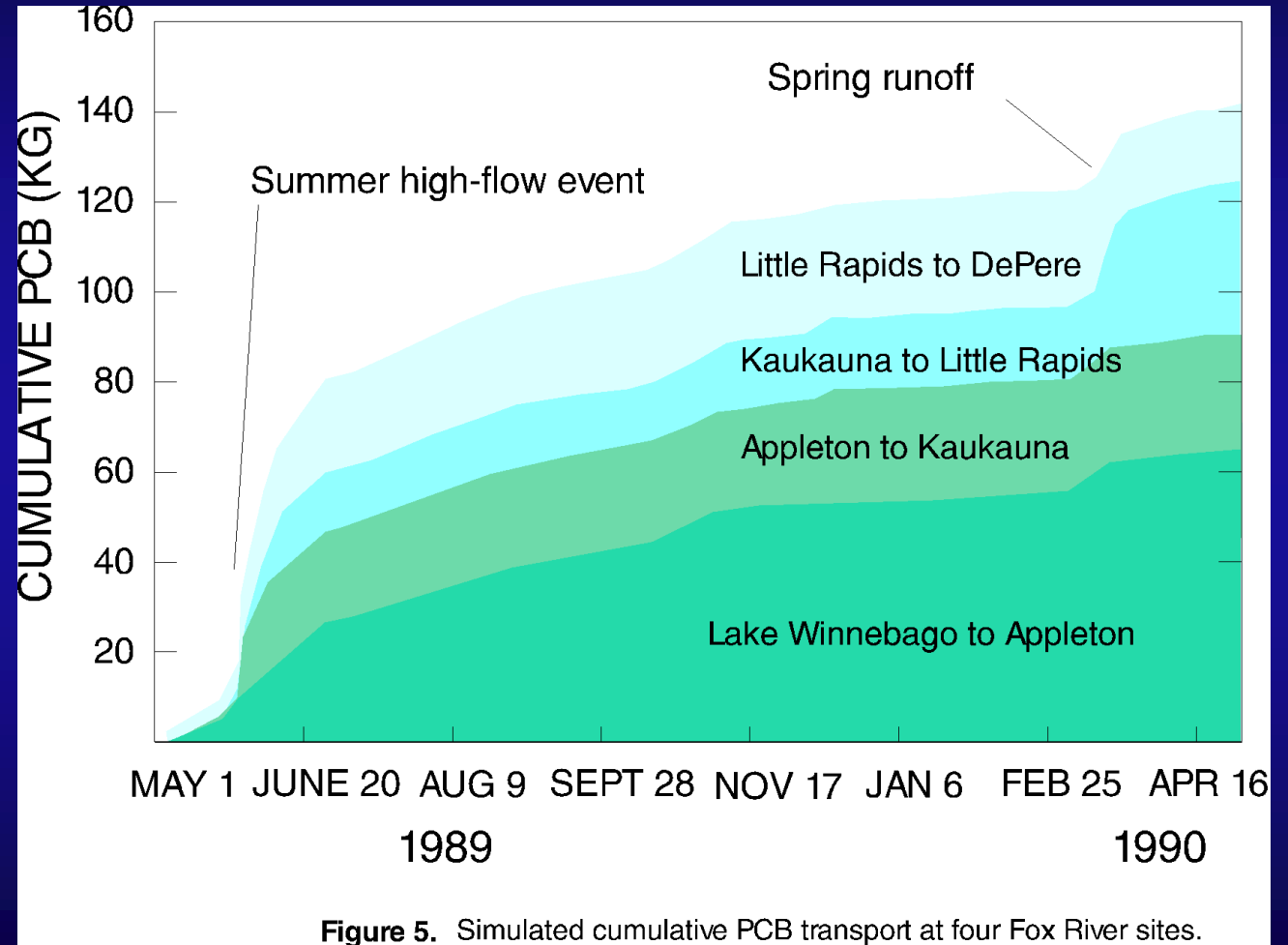
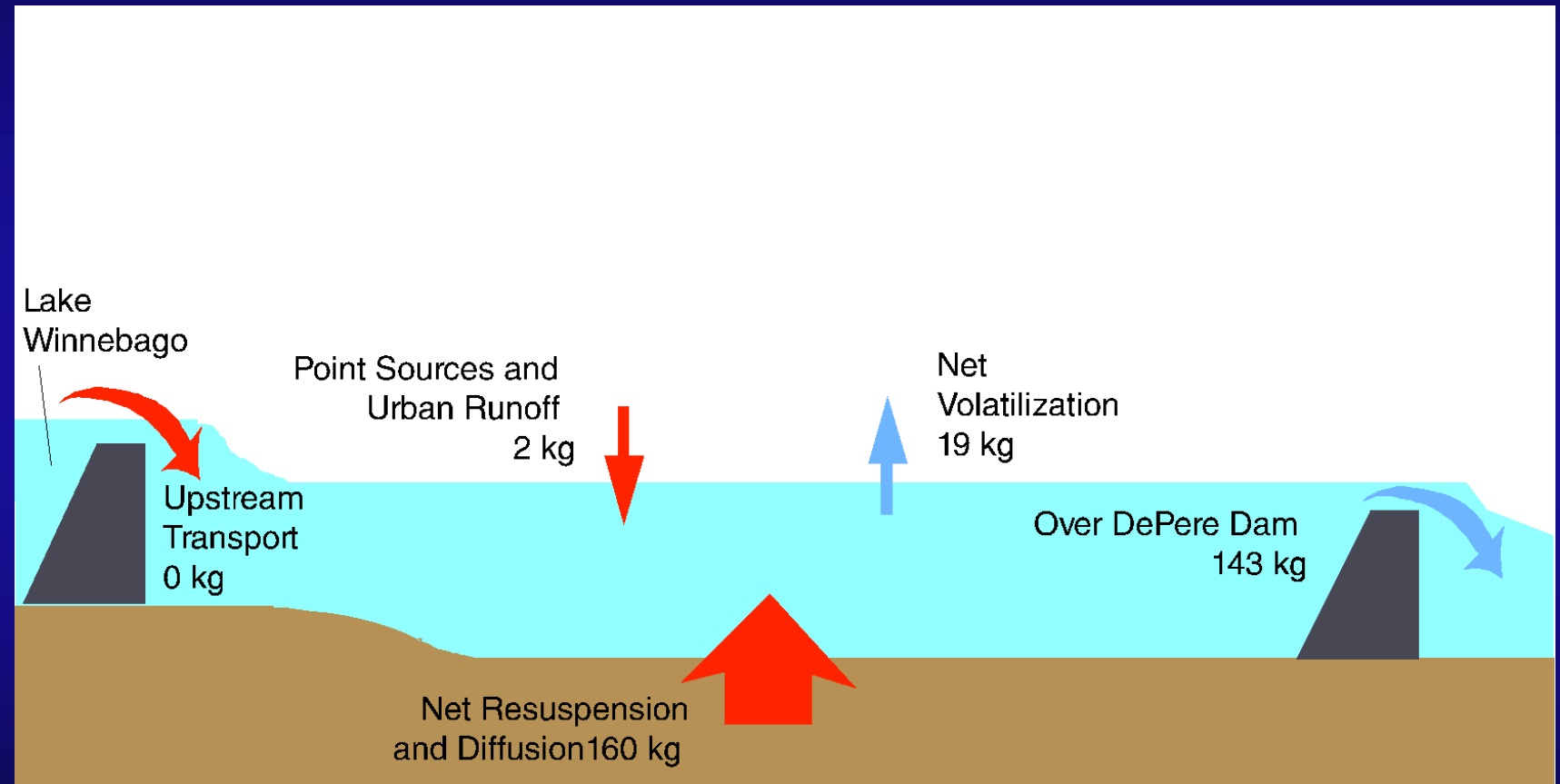


Figure 5. Simulated cumulative PCB transport at four Fox River sites.

2 <http://wi.water.usgs.gov/pubs/FS-116-96/>

Transport of PCBs via Resuspension and Diffusion

- Fox River Study found that transport was dominated by resuspension of contaminated sediment ²
- Decreasing runoff events decreases resuspension of contaminated sediments.
- Co-benefit of BMP implementation



² <http://wi.water.usgs.gov/pubs/FS-116-96/>

Questions?